

In re Application of Rajarajan et al.
Serial No. 09/742,761

REMARKS

The Office action has been carefully considered. Claims 1-5, 7-10, 15-16, 22-26, 31, 35-39, 41, 43-49, and 51 were rejected under 35 U.S.C. § 102(b) as being anticipated by Clark et al. "Response to UML 2.0 Request for Information", Precise UML Group, December, 1999 ("Clark"). Claims 6, 40, and 50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Clark in view of U.S. Patent No. 6,542,595 to Hemzai et al. ("Hemzai"). Claims 11-14, 20-21, 27-30, 33, and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Clark in view of U.S. Patent No. 5,958,012 to Battat et al. ("Battat"). Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Clark in view of U.S. Patent No. 6,041,143 to Chui et al. ("Chui"). Claims 18 and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Clark in view of U.S. Patent No. 6,353,448 to Scarborough et al. ("Scarborough"). Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Clark in view of U.S. Patent No. 5,907,704 to Gudmundson et al. ("Gudmundson"). Claim 42 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Clark in view of U.S. Patent No. 6,430,538 Bacon et al. ("Bacon"). Applicants respectfully disagree.

By present amendment, claims 1, 37, 39, 45, and 48 have been amended for clarification and not in view of the prior art. Applicants submit that the claims as filed were patentable over the prior art of record, and that the amendments herein are for purposes of clarifying the claims and/or for expediting allowance of

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the claims and not for reasons related to patentability. Reconsideration is respectfully requested.

Applicants thank the Examiner for the interview held (by telephone) on May 19, 2006. During the interview, the Examiner and applicants' attorney discussed the claims with respect to the prior art. The essence of applicants' position is incorporated in the remarks below.

Prior to discussing reasons why applicants believe that the claims in this application are clearly allowable in view of the teachings of the cited and applied references, a brief description of the present invention is presented.

The present invention is directed, generally, to providing a method and system for handling specific aspects of modeling visual elements. In one embodiment, a system and method logically separates the notation of a model element object, from the semantics of that notation. A modeling element's notation may be defined as a visual representation such as an icon, image or shape, (e.g., circle, a triangle, or a line) of a particular modeling element. A semantic of a modeling element may be defined as what the notation represents or means and how it may behave in its current environment (e.g., an electrical connection, a wall, or a chair).

The present invention, implemented in a Visual Modeling Framework (VMF), separates these two logical concepts into separate code components, whereby various notations and semantics from different providers may be combined. VMF defines the API set/interfaces to which pluggable semantic and notation objects conform, and allows a notation and a semantic to be plugged

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into or otherwise associated with each other to create a model element, thereby allowing pluggable notations. VMF also allows pluggable semantics, e.g., to enable UML notations to be used to design a complex software diagram, yet switch between 'Semantic' objects for Visual Basic and 'Semantic' objects in C++.

Each such model element also includes component interfaces, the primary purpose of which is to handle component communication between model elements, between a paradigm server and the model elements it serves, and between the surface and the model elements it contains. The notation and semantics that comprise a model element are each objects having such interfaces.

Note that the above description is for example and informational purposes only, and should not be used to interpret the claims, which are discussed below.

\$102 Rejections

Turning to the claims, independent claim 1, as amended, generally recites a computer-readable medium having computer-executable instructions, comprising providing a plurality of notations, each notation comprising a visual representation of a model element, providing a plurality of semantics, each semantic comprising a meaning indicative of behavior in a modeling environment of a model element, and associating a selected notation with a selected semantic to provide a model element having a visual representation and a meaning in a modeling environment.

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The Office action rejected claim 1 as being anticipated by Clark. More specifically, the Office action contends that Clark teaches providing a plurality of notations, each notation comprising a visual representation of a model element. Fig. 1 of page 10 as well as section 3.1.6 of page 22 of Clark is referenced. Further, the Office action contends that Clark teaches providing a plurality of semantics, each semantic comprising a meaning in a modeling environment of a model element. Again, Fig. 1 of page 10 of Clark is referenced as well as section 4.1 of page 24 and section 4.4 of page 25. Further yet, the Office action contends that Clark teaches associating a selected notation with a selected semantic to provide a model element having a visual representation and a meaning in a modeling environment. Once again, page 10 of Clark is referenced. Applicants respectfully disagree.

Applicants submit that Clark does not teach let alone even suggest the plainly claimed limitations of claim 1. Clark, as a reference, generally discloses a committee report regarding the state of Unified Modeling Language (UML) as of 1999 and various trends and deficiencies known in the industry. More specifically, the report addresses the nature of what the report refers to as semantics. As defined and used in the report, semantics refers to a human language interpretation of executable code that is often associated with executable code to help human readers of the code understand better what the code is trying to accomplish. In fact, Clark specifically recites that, in an effort to avoid confusion, semantics refers to the meaning of a language and not to any behavioral constraints. See Introduction, section 1 of Clark. Thus, Clark

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discloses several recommendations as to how to best implement a semantics scheme within the context of a Unified Modeling Language.

Different from and in direct contrast to Clark, the present invention refers to semantics as specifically indicating a behavioral constraint of a modeling element. A modeling element, in various embodiments of the present invention may include notations (which are indicative of the appearance of a modeling element) and semantics (which are indicative of the manner in which the elements interact with other elements in a given modeling environment, *i.e.*, behavior). Clearly, Clark is using the term semantics in a vastly different (and directly opposite) manner than is used in the present invention as claimed. This may be easily explained as the definition of the term semantics has migrated from the understanding in 1999 (as in Clark). Clearly, semantics as used herein is distinguishable over the manner in which Clark uses the term semantics, that is, as a meaning of a language and not to any behavioral constraints.

Notwithstanding these clear differences in the use of the term semantics, claim 1 has been amended to recite that the semantics are indicative of behavior. Surely this clarifies that claim 1 is distinguishable over Clark, as Clark specifically teaches away from the present invention by teaching that its semantics are not indicative of behavior. For at least the foregoing reasons, applicants submit that claim 1 is allowable over the prior art of record.

Applicants respectfully submit that dependent claims 2-5, 7-10, 15-16, 22-26, 31 and 35-36, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 1 and consequently includes the

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limitations of independent claim 1. As discussed above, Clark fails to teach the limitations of claim 1 (and in fact teaches away from them) and therefore these claims are also allowable over the prior art of record. In addition to the recitations of claim 1 noted above, each of these dependent claims includes additional patentable elements.

For example, claim 2 recites that the selected notation and the selected semantic each comprise an object, and wherein associating the selected notation with the selected semantic comprises connecting the selected notation object to the selected semantic object via object interfaces. Indeed, the specification of the present invention specifically refers to semantics in terms of interfaces, using object-oriented programming examples. With this concept, semantics and notations may be represented as objects capable of connecting via interfaces. This allows the realization of a significant advantage of the present invention, namely, the ability to attach both a notation and a semantic to a visual modeling element such that the visual modeling element may be modeled in any environment as opposed to only those environments that may be privy to code regarding the notation and semantics of the element to begin with. This further reinforces the differences between Clark's use of semantics and that which is called for in the claims.

Additionally, claim 3 recites that the objects are connected to a paradigm server. Each of these claims further distinguish the definition of semantics, e.g., as being related to an object as used in object-oriented programming. This is clearly different than what is discussed in Clark, which is wholly concerned with

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providing a well-documented scheme for describing a modeling language. For at least these additional reasons, applicants submit that claims 2 and 3 are allowable over the prior art of record.

Turning to the next independent claim, amended claim 37 generally recites a system, comprising a notation comprising a representation of a model element in at least one modeling environment, the notation including an interface configured to provide access to methods therein, a semantic indicative of behavior comprising a meaning of a model element in at least one modeling environment, the semantic including an interface configured to provide access to methods therein, and a paradigm server, the server connected to a modeling environment and configured to access the methods of the notation and the methods of the semantic via their respective interfaces, and further configured to enable a determination as to whether the paradigm server, notation and semantic are each compatible, and if they are compatible, to associate the notation with the semantic to provide a model element in the modeling environment.

The Office action rejected claim 37 as being anticipated by Clark. More specifically, the Office action cited the same sections of Clark as were cited with respect to the rejection of claim 1. Applicants respectfully disagree.

As discussed above, Clark is directed to a recommendation report by a committee regarding the best manner to describe how a specific modeling language (UML) is annotated. In these recommendations, "semantics" are described as common language descriptions of the meanings of elements in the

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UML. To this end, semantics are specifically distinguished as not indicative, in any manner, of a behavior of the elements to which the meaning is assigned.

In stark contrast, claim 37 recites a semantic indicative of behavior. Furthermore, the semantic recited in claim 37 is also different from any semantic disclosed in Clark because of the nature of its interfaced relationship with both the element itself as well as a notation also associated with the element. As has been clearly shown above, the term semantic as used in claim 37 is simply not taught by Clark or any other prior art of record. For at least the foregoing reasons, applicants submit that claim 37 is allowable over the prior art of record.

Applicants respectfully submit that dependent claim 38, by similar analysis, is allowable. This claim depends directly from claim 37 and consequently includes the recitations of independent claim 37. As discussed above, Clark fails to teach the recitations of claim 37 and therefore these claims are also allowable over the prior art of record. In addition to the recitations of claim 37 noted above, claim 38 includes additional patentable elements, e.g., object concepts.

Turning to the next independent claim, amended claim 39 generally recites a computer-implemented method, comprising selecting a selected notation from a plurality of notations, each notation comprising a visual representation of a model element, selecting a selected semantic indicative of behavior from plurality of semantics, each semantic comprising a meaning in a modeling environment of a model element, and validating whether the selected notation can be associated with the selected semantic.

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The Office action rejected claim 39 as being anticipated by Clark. More specifically, the Office action cited the same sections of Clark as were cited with respect to the rejection of claim 1. Applicants respectfully disagree.

Applicants submit that Clark does not teach all of the recitations of claim 39. Clark, as a reference, generally discloses a committee report regarding the state of Unified Modeling Language (UML) as of 1999 and various trends and deficiencies known in the industry. As defined and used in the report, semantics refers to a human language interpretation of executable code that is often associated with executable code to help human readers of the code understand better what the code is trying to accomplish. In fact, Clark specifically recites that, in an effort to avoid confusion, semantics refers to the meaning of a language and not to any behavioral constraints.

Differently from and in direct contrast to Clark, the present invention recites "selecting a selected semantic indicative of behavior from plurality of semantics." A modeling element, in various example embodiments of the present invention may include notations (which are indicative of the appearance of a modeling element) and semantics (which are indicative of the manner in which the elements interact with other elements in a given modeling environment, *i.e.*, behavior). Clearly, Clark is using the term semantics in a far different (and directly opposite) manner than is used in the present invention, as Clark specifically discloses that its semantics are not indicative of behavior. For at least the foregoing reasons, applicants submit that claim 39 is allowable over the prior art of record.

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Applicants respectfully submit that dependent claims 41, and 43-44, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 39 and consequently includes the recitations of independent claim 39. As discussed above, Clark fails to teach the recitations of claim 39 and therefore these claims are also allowable over the prior art of record. In addition to the recitations of claim 39 noted above, each of these dependent claims includes additional patentable elements.

Turning to the last two remaining independent claims, amended claim 45 generally recites a computer-readable medium having computer-executable instructions, comprising providing a plurality of notations from at least a first provider, each notation comprising a visual representation of a model element, providing a plurality of semantics from at least a second provider, each semantic comprising a meaning indicative of a behavior in a modeling environment of a model element, and associating a selected notation from the at least first provider with a selected semantic from the at least second provider to provide a model element having a visual representation and a meaning in a modeling environment.

Further, amended claim 48 generally recites a computer-readable medium having stored thereon a plurality of data structures, comprising a notation data structure from at least a first provider having a set of at least one interface for accessing a plurality of methods therein and a semantic data structure indicative of a behavior from at least a second provider having a set of at least one interface for accessing a plurality of methods therein, the semantic data structure

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from the at least second provider being associated with the notation data structure from the at least first provider to provide a model element.

The Office action rejected claims 45 and 48 as being anticipated by Clark. More specifically, the Office action cited the same sections of Clark as were cited with respect to the rejection of claim 1. Applicants respectfully disagree for at least reasons similar to those explained above. Both claims 45 and 48 recite similar language to each of the previously addressed independent claims. Specifically, these claims also recite semantics that are indicative of behaviors which is a concept not taught by Clark, and indeed, is taught away from in Clark. For at least these reasons, applicant submit that claims 45 and 48 are allowable over the prior art of record.

Applicants respectfully submit that dependent claims 46-47, 49 and 51, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from either claim 45 or 46 and consequently includes the recitations of these independent claims. As discussed above, Clark fails to teach the recitations of both claims 45 and 46 and therefore these claims are also allowable over the prior art of record. In addition to the recitations of claims 45 and 46 noted above, each of these dependent claims includes additional patentable elements.

§103 Rejections

The Office action rejected claims 6, 11-14, 17-21, 27-30, 32-34, 40, 42, and 50 as being unpatentable over Clark in view of one or more other prior art

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references. Without detailing each of the several and disparate rejections under §103, applicants respectfully disagree.

Applicants submit that the Office action has failed to establish a *prima facie* case for obviousness. Applicants respectfully submit that these dependent claims are allowable by similar analysis to each respective independent claim to which these claims respectively depend as discussed above. Each of these claims depends either directly or indirectly from a previously addressed independent claim and consequently includes the recitations of each respective independent claim. As discussed above, Clark fails to disclose the limitations of any of the independent claims, and the other prior art of record, even if permissible to combine, does not cure Clark's deficiencies. In short, Clark, whether considered individually or in any permissible combination with any prior art of record, still fails to teach or suggest the recitations of these claims and therefore these claims are also allowable over the prior art of record. In addition to the recitations of the independent claims noted above, each of these dependent claims includes additional patentable elements.

For at least these reasons, applicants submit that all the claims are patentable over the prior art of record. Reconsideration and withdrawal of the rejections in the Office action is respectfully requested and timely allowance of this application is earnestly solicited.

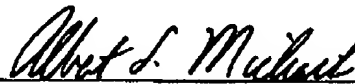
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CONCLUSION

In view of the foregoing remarks, it is respectfully submitted that claims 1-51 are patentable over the prior art of record, and that the application is in good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,



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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this Response, along with transmittal, and facsimile cover sheet, are being transmitted by facsimile to the United States Patent and Trademark Office in accordance with 37 C.F.R. 1.6(d) on the date shown below:

Date: July 18, 2006



Albert S. Michalik

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